	Application No.	Applicant(s)
Notice of Allowability	09/507,542	DAVIDSON ET AL.
	Examiner	Art Unit	
	Eduardo Garcia-Otero	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amendment received 11/8/04*.

2. ☒ The allowed claim(s) is/are *1-12,16-19,21-23 and 25-28*.

3. ☒ The drawings filed on *10 February 2000* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

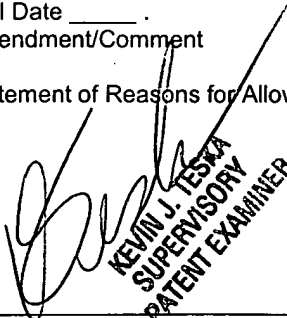   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

ALLOWANCE

Introduction

1. Title is: METHOD AND APPARATUS FOR GEOMETRIC VARIATIONS TO INTEGRATE PARAMETRIC COMPUTER AIDED DESIGN WITH TOLERANCE ANALYSIES AND OPTIMIZATION

2. First named inventor is: DAVIDSON

3. The pending claims are 1-12, 16-19, 21-23, and 25-28.

4. Applicant's Amendment was received 11/8/04, which cancelled claim 24. All other claims have already been indicated as allowable.

5. Applicant claims priority to U.S. Provisional application serial No. 60/120,961 filed Feb. 19, 1999.

Index of Important Prior Art

6. Iannuzzi refers to US Patent 5,586,052.

7. Hoppe refers to US Patent 6,137,492.

8. Krishnamurthy refers to US Patent 6,256,039.

9. Ballas refers to US Patent 4,800,652.

10. Carlstrom refers to US Patent 5,875,264.

11. Rose refers to US Patent 5,574,468.

12. Kedem refers to US Patent 4,649,498.

13. Kamiguchi refers to US Patent 5,549,857.

14. Kandikjan refers to "A mechanism for validating dimensioning and tolerancing schemes in CAD systems", by T. Kandikhan et. al., Computer-Aided Design 33 (2001) 721-737.

15. Maxey refers to New Riders' Reference Guide to AutoCAD 13, by Randall A. Maxey et. al., New Riders Publishing, 1995, ISBN 1-56205-237-3, pages 227-229 (DIM), pages 227-284 (DVIEW), 674-679 (TOLERANCE and parallelism).

Definitions

16. McGraw-Hill Dictionary refers to The McGraw-Hill Dictionary of Scientific and Technical Terms, Sixth Edition, by McGraw-Hill Companies, Inc., ISBN 0-07-042313-X, 2003:

- **barycentric coordinates** "The coefficients in the representation of a point in a simplex as a linear combination of the vertices of the simplex."
- **simplex** "An n-dimensional simplex in a Euclidean space consists of n + 1 linearly independent points... a triangle with its interior and a tetrahedron with its interior are examples."

REASONS FOR ALLOWANCE

17. Applicant's amendment cancelled claim 24.

18. All other claims have previously been indicated as allowable.

19. Claim 1 (previously amended) is the only independent claim.

20. Specifically, independent claim 1 is allowable because no prior art teaches organizing tolerance data using a 6 level hierarchical system comprising:

- [1]-OBJECT LEVEL. One or more objects.
- [2]-FEATURE LEVEL. Each object may contain one or more features.
- [3]-ZONE LEVEL. Each feature may contain one or more tolerance zones.
- [4]-FORM LEVEL. Each tolerance zone contains exactly one algebraic form and exactly one geometric form.
- [5]-MAP LEVEL. Each geometric form contains exactly one tolerance map.
- [6]-SUBMAP LEVEL. Each tolerance map may contain one or more submaps.

21. Dependent claims 2-12, 16-19, 21-23, and 25-28 are allowable because they depend from allowable independent claim 1, and add further limitations.

Conclusion

22. Claims 1-12, 16-19, 21-23, and 25-28 are allowable. In other words, independent claim 1 and its dependent claims are allowable.

23. All other prior objections and rejections are withdrawn.
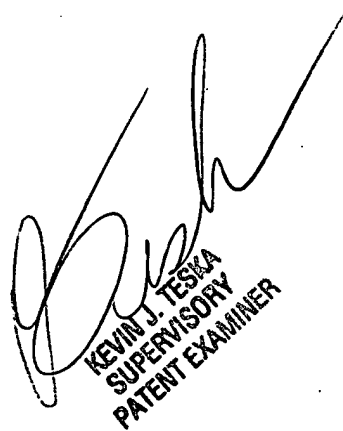
Communication

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eduardo Garcia-Otero whose telephone number is 703-305-0857. The examiner can normally be reached on Monday through Thursday from 9:00 AM to 8:00 PM. If attempts to reach the Examiner by telephone are unsuccessful,

the Examiner's supervisor, Kevin Teska, can be reached at (703) 305-9704. The fax
phone number for this group is 703-872-9306.

25. Any inquiry of a general nature or relating to the status of this application or proceeding
should be directed to the group receptionist, whose telephone number is (703) 305-3900.

* * * *

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER